

## Mono-benzyl phthalate

CAS No. 2528-16-7

*Metabolite of benzylbutyl phthalate (CAS No. 85-68-7)*

Benzylbutyl phthalate is an industrial solvent and additive used in products such as adhesives, vinyl-flooring products, sealants, car-care products, and to a lesser extent, some personal-care products. People exposed to benzylbutyl phthalate will excrete mono-benzyl phthalate in their urine. The amount of mono-benzyl phthalate is an indicator of how much contact with benzylbutyl phthalate has occurred.

Workplace air standards for external exposure have not been established (OSHA, ACGIH) for benzylbutyl phthalate. Generally, benzylbutyl phthalate has low acute toxicity. It is classified as a possible human carcinogen (U.S. EPA) but considered not classifiable by IARC and incompletely classified by NTP. Information about external exposure (environmental levels) and health effects is available from the EPA IRIS Web site at <http://www.epa.gov/iris>.

Concentrations reported here are similar to or slightly lower than those reported in a non-random subsample from NHANES III participants (Blount et al., 2000). In the current NHANES 1999-2000 subsample, geometric

**Table 66. Mono-benzyl phthalate**

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999-2000.

	Geometric mean (95% conf. interval)	Selected percentiles (95% confidence interval)						Sample size
		10th	25th	50th	75th	90th	95th	
<b>Total, age 6 and older</b>	15.3 (14.0-16.8)	2.80 (2.30-3.50)	6.90 (6.00-8.20)	17.0 (15.3-18.6)	35.3 (32.8-38.9)	67.1 (56.8-80.7)	103 (90.3-123)	2541
<b>Age group</b>								
6-11 years	39.4 (34.7-44.8)	9.40 (7.20-13.9)	22.1 (17.2-28.1)	40.3 (34.2-48.6)	82.0 (59.9-90.0)	128 (98.1-214)	214 (107-464)	328
12-19 years	25.6 (22.7-29.0)	6.30 (5.10-8.10)	13.4 (10.8-15.9)	28.3 (23.0-33.6)	51.1 (43.7-58.5)	87.9 (71.2-106)	125 (100-160)	752
20 years and older	12.4 (11.3-13.8)	2.20 (1.80-2.80)	5.80 (5.10-6.40)	13.8 (12.3-15.3)	28.9 (26.5-31.9)	52.0 (45.3-56.8)	86.3 (61.3-103)	1461
<b>Gender</b>								
Males	16.2 (14.5-18.0)	3.40 (2.40-4.40)	8.00 (6.00-9.20)	17.7 (15.5-19.4)	35.4 (32.8-38.6)	69.4 (59.9-85.8)	108 (94.0-139)	1215
Females	14.6 (13.0-16.3)	2.40 (1.90-3.10)	6.10 (5.20-7.60)	16.0 (14.2-19.2)	35.8 (31.0-41.0)	63.7 (54.7-74.1)	103 (86.3-116)	1326
<b>Race/ethnicity</b>								
Mexican Americans	13.9 (11.9-16.4)	2.40 (1.70-3.50)	6.30 (5.20-7.80)	15.7 (12.1-18.0)	33.0 (26.7-37.2)	67.5 (55.9-80.6)	98.3 (80.6-150)	814
Non-Hispanic blacks	23.0 (20.0-26.5)	5.10 (3.70-6.40)	12.3 (10.0-13.7)	23.0 (20.0-27.0)	49.3 (40.1-56.1)	94.0 (79.1-130)	138 (115-233)	603
Non-Hispanic whites	14.3 (12.7-16.0)	2.50 (1.90-3.20)	6.50 (5.30-8.10)	16.1 (14.3-18.5)	33.9 (30.7-37.5)	58.7 (52.0-71.5)	103 (73.4-116)	911

mean levels of the demographic groups were compared after adjustment for the covariates of race/ethnicity, age, gender, and urinary creatinine. Urinary mono-benzyl phthalate levels were found to be higher for children aged 6-11 years than for the other two age groups, and levels in people aged 12-19 years were higher than levels in those aged 20 years and older. Females had higher levels than males.

It is unknown whether differences between ages or genders represent differences in exposure, body-size relationships, or metabolism. A statistical examination of phthalate levels in a non-random subsample from NHANES III (Koo et al., 2002) suggested that a lower income and a lower level of education were associated

with higher urinary concentrations of mono-benzyl phthalate.

**Table 67. Mono-benzyl phthalate (creatinine adjusted)**

Geometric mean and selected percentiles of urine concentrations (in µg/gram of creatinine) for the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999-2000.

	Geometric mean (95% conf. interval)	Selected percentiles (95% confidence interval)						Sample size
		10th	25th	50th	75th	90th	95th	
<b>Total, age 6 and older</b>	14.0 (13.0-15.0)	4.41 (3.64-4.75)	7.57 (6.89-8.45)	13.3 (12.7-14.6)	25.1 (23.5-27.0)	50.1 (41.4-59.6)	77.4 (69.2-88.7)	2541
<b>Age group</b>								
6-11 years	40.0 (34.1-46.9)	12.5 (9.32-18.3)	21.7 (19.4-27.2)	38.4 (30.3-50.6)	73.2 (58.2-89.4)	104 (89.4-142)	142 (99.8-173)	328
12-19 years	17.3 (15.5-19.3)	6.01 (5.39-7.09)	10.6 (8.68-12.3)	17.0 (14.9-19.7)	28.3 (24.9-32.3)	49.7 (41.4-61.7)	69.3 (50.1-81.9)	752
20 years and older	11.8 (10.9-12.7)	3.59 (3.16-4.42)	6.67 (6.09-7.46)	12.1 (11.3-12.8)	20.1 (18.5-23.1)	34.3 (30.5-40.8)	57.2 (42.5-73.9)	1461
<b>Gender</b>								
Males	12.7 (11.6-13.9)	3.81 (3.26-4.67)	6.58 (5.94-7.61)	12.3 (11.5-13.1)	23.7 (21.5-26.1)	44.5 (36.6-53.3)	73.5 (57.0-89.4)	1215
Females	15.3 (14.1-16.5)	4.84 (4.38-5.72)	8.73 (7.52-9.63)	14.7 (13.3-16.1)	25.9 (24.1-29.2)	56.4 (41.4-64.3)	80.0 (64.8-99.1)	1326
<b>Race/ethnicity</b>								
Mexican Americans	12.6 (11.2-14.3)	3.49 (3.00-4.21)	6.55 (5.49-7.77)	11.9 (10.7-13.5)	24.1 (20.8-28.7)	46.5 (40.9-54.2)	68.1 (55.2-98.8)	814
Non-Hispanic blacks	14.8 (13.0-16.9)	4.93 (3.96-5.88)	7.81 (7.12-8.75)	13.6 (11.7-15.6)	26.9 (21.9-32.4)	55.5 (38.7-77.2)	86.8 (64.4-99.8)	603
Non-Hispanic whites	14.0 (12.7-15.3)	4.42 (3.52-4.77)	7.66 (6.47-8.75)	13.4 (12.6-15.2)	25.2 (23.2-27.3)	53.3 (38.6-65.6)	77.9 (69.1-90.3)	911